

REMARKS

Reconsideration of the issues raised in the above referenced Office Action is respectfully solicited.

The objection to the drawings due to the drawing reference numeral "1" not being present in the specification has been considered. The specification has been amended to now recite a welding tong drive 1. This feature is present in original Claim 1 and thus no new matter is presented. Therefore, Applicant requests withdrawal of the objection to the drawings.

The objection to the Abstract has been considered. The Abstract has been amended to delete legal phraseology and to not exceed 150 words in length. Approval of the amended Abstract is respectfully requested.

The objections to the specification for lacking section headings and for referencing the claims have been considered. The substitute specification includes section headings, removes claim references, and addresses other informalities therein.

The objections to Claims 1-6, 10 and 13-17 set forth in paragraph 5 of the Office Action have been considered. The claims have been amended to delete reference numerals and to address the other objections. In view of the amendments, withdrawal of the claim objections is respectfully requested.

The rejection of Claims 1-18 under 35 USC §112, second paragraph, as being indefinite has been considered. Claims 1-18 have been amended extensively to address the Examiner's comments and Applicant's amendments adopt many of the Examiner's suggestions. In view of the amendments to the claims, reconsideration and withdrawal of the rejection of claims under 35 USC §112, second paragraph is respectfully requested.

The rejection of Claims 1-18 under 35 USC §102(b) as anticipated by Kobayashi, U.S. Patent No. 5 988 486 has been considered.

Kobayashi discloses a method of controlling electrode force on a spot welding gun that utilizes a pressing source 4 and a driving source 6. In operation, the upper electrode tip 5 is moved by the pressing source 4 downward in the closing direction. At the same time, the lower electrode tip 3 is moved from the open position upward in the closing direction by the driving source 6 moving the main gun body 2 upwardly as set forth at column 6, lines 9-22. The lower electrode tip 3 and the upper electrode tip 5 reach the respective landing start positions at the same time. Thereafter, the electrode tips are moved at a slower speed until contact with a workpiece as disclosed at column 6, lines 49-67.

Figure 8 of Kobayashi shows the drive devices 46 as two separate drive devices for an X-shaped gun. The pressing source 4 swings an upper gun arm 10 in a vertical direction as disclosed at column 9, lines 1-6. The driving source 6 moves the entire gun in a linear direction.

Applicant's Claim 1 recites "actuation of the secondary drive device up to contacting of the welding object with at least one welding tong limb and acquisition of the contacting". Claim 1 further recites "after acquisition of the contacting, closure of the welding tong limbs by the primary drive device with build-up of a predetermined compressive force for welding". Thus, Claim 1 recites a secondary drive device operating so that a welding tong limb contacts the welding object and a separate primary drive device closes the welding tong limbs. As discussed above, Kobayashi discloses at start up, moving both of the welding arms with separate drive devices.

Further, Kobayashi does not disclose a primary drive device for closure of the welding tong limbs, as the driving devices of Kobayashi operate on only one arm and on the entire body of the gun, respectively. Therefore, Kobayashi does not disclose or suggest one drive device that moves both welding tong limbs towards the welding object as recited in Applicant's Claim 1.

Moreover, Applicant's two claimed drive devices are separately utilized to obtain different advantages, such as detecting the spacial position of the welding tong. This arrangement is not possible in Kobayashi which only discloses detecting contact of the welding object with the lower tip by using the motor current. During movement in Kobayashi, the speed of the upper tip relative to the work piece is the same as the speed of the main body moving the lower tip in the closing direction. If the upper tip of Kobayashi contacts the work piece first, the lower tip will be raised.

More importantly, Applicant's Claim 1 recites that the primary drive device operates "after acquisition of the contact" by the secondary drive device. Thus, Applicant's two drive devices are not operated simultaneously, whereas Kobayashi discloses the drive devices operating simultaneously.

Applicant's Claim 18 further recites that "the secondary drive device is swiveled by at least two single drives of the welding tongs essentially within a hemisphere". Thus, the secondary drive can move the welding tongs in more than one plane. This feature is not present in Kobayashi, which relies on the robot arm to move the spot welding gun arrangement in various planes.

For the above reasons, Claim 1, and Claims 2-18 dependent therefrom, distinguish Kobayashi and withdrawal of the rejection under 35 USC §102(b) is respectfully requested.

The rejection of Claims 1, 2, 13, 14, 16 and 18 under 35 USC §102(b) as being anticipated by Obara, U.S. Patent No. 5 091 623 has been considered.

Obara discloses a welding gun provided with a backup cylinder. The welding gun shown in Figure 3 has inwardly oriented electrodes on first and second movable arms 43, 44. As disclosed at column 3, lines 42-66, in operation a backup cylinder 46 moves the first arm 43 toward and into contact with a workpiece 52. Thereafter a main cylinder 49 is actuated so that the electrode 51 on the second movable arm 44

is brought into contact with the workpiece and a pressure force is applied by the first and second arms. Therefore, each cylinder drives one of the movable arms.

Applicant's Claim 1 recites that the primary device "moves at least two welding tong limbs" towards a welding object. This arrangement differs from Obara wherein a first arm is moved by a back-up cylinder and a separate main cylinder moves the second arm. Claim 1 further recites "closure of the welding tong limbs by the primary drive device with buildup of a predetermined compressive force for welding". Obara does not disclose or suggest applying a force to each of the arms with a primary drive device, but instead relies on two separate cylinders.

Claim 18 recites that the secondary drive device is "swiveled by at least two single drives of the welding tongs essentially within a hemisphere". Obara relies on a robot with a robot arm 1 to move the welding gun 2 to various spacial positions within three degrees of movement. Therefore, Obara does not disclose or suggest a secondary drive device swiveled by two single drives, much less essentially within a hemisphere.

For the above reasons independent Claim 1, and Claims 2, 13, 14, 16 and 18 dependent therefrom, distinguish Obara and allowance thereof is respectfully requested.

Added Claims 19 and 20 further distinguish the applied prior art. Independent Claim 19 recites a method for controlling welding tong movement for a welding tong of a welder having one primary and at least one secondary drive device. Claim 19 further recites "maintaining said welding tong limbs in a fixed spatial relationship with respect to each other during the pivoting of the welding tong". This feature is not present in Kobayashi which discloses operating the pressing source and the driving source simultaneously.

Applicant's Claim 19 further recites "actuating the primary drive device to apply a closing force to each of the welding tong limbs". As discussed above, Obara discloses two

separate drive cylinders for separately driving or moving each of the respective arm carrying electrodes.

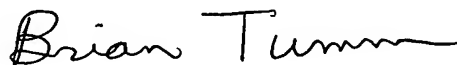
Dependent Claim 20 further recites providing another secondary drive device that "moves the welding tong about a rotation axis that is transverse to the pivot axis of the welding tong" and a "robot device". There is no disclosure or suggestion in Obara or Kobayashi of providing another drive device separate from a robot device for pivoting the welding tong in a transverse direction to the rotation axis of the welding tong.

For the above reasons Claims 19 and 20 distinguish the applied prior art.

For the above reasons, allowance of Claims 1-20 is respectfully requested.

Further and favorable reconsideration is respectfully solicited.

Respectfully submitted,



Brian R. Tumm

BRT/ad

FLYNN, THIEL, BOUTELL
& TANIS, P.C.
2026 Rambling Road
Kalamazoo, MI 49008-1631
Phone: (269) 381-1156
Fax: (269) 381-5465

Dale H. Thiel	Reg. No. 24 323
David G. Boutell	Reg. No. 25 072
Terryence F. Chapman	Reg. No. 32 549
Mark L. Maki	Reg. No. 36 589
Liane L. Churney	Reg. No. 40 694
Brian R. Tumm	Reg. No. 36 328
Steven R. Thiel	Reg. No. 53 685
Donald J. Wallace	Reg. No. 43 977
Sidney B. Williams, Jr.	Reg. No. 24 949

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